

Claims

- [c1] 1. A lighting system for night vision applications comprising:
- a near infrared light source;
 - an optical element disposed a distance from said near infrared source, the optical element having an input surface for receiving light from said near infrared source and an output surface for emitting said received light in a desired emission pattern; and
 - at least one visible, non-red light source arranged proximate a surface of the optical element such that the output surface of said optical element emits said visible light to mask the emitted near infrared light.
- [c2] 2. A lighting system according to claim 1 wherein said near infrared light source comprises a laser diode emitting light at wavelengths between approximately 800–900nm and said visible, non-red light source comprises a light source emitting light at wavelengths between approximately 400–600nm.
- [c3] 3. A lighting system according to claim 1 wherein said visible, non-red light source comprises a plate having a plurality of non-red LEDs arranged thereon.

- [c4] 4. A lighting system according to claim 2 wherein said visible, non-red light source comprises a plurality of non-red LEDs.
- [c5] 5. A lighting system according to claim 3 wherein said optical element comprises a substantially planar thin-sheet optical element, and said plate is arranged substantially parallel to an exterior surface of said optical element.
- [c6] 6. A lighting system according to claim 5 wherein said plate is arranged proximate a surface of said optical element that is perpendicular to said input surface.
- [c7] 7. A lighting system according to claim 3 wherein each non-red LED includes a respective collimating lens.
- [c8] 8. A lighting system according to claim 1 comprising a camera adapted to receive near infrared light from said near infrared light source reflected off an object within a camera field of view.
- [c9] 9. A lighting system according to claim 8 comprising a display for imaging objects detected within said camera field of view.
- [c10] 10. A lighting system according to claim 1 wherein said optical element output surface is approximately perpen-

dicular to said input surface, and said optical element comprises a stepped surface angled between the input surface and the output surface, the stepped surface having a plurality of reflecting facets arranged such that the light is reflected by the plurality of reflecting facets in passing from the input surface to the output surface.

[c11] 11. A lighting system according to claim 1 wherein said optical element comprises a thin-sheet optical element comprising an aspherical entrance surface for collimating light passing through the entrance surface, a substantially planar exit surface generally perpendicular to an axis of symmetry of the entrance surface, and a stepped surface opposing the substantially planar exit surface having a plurality of steps generally parallel to the exit surface separated by associated angled facets disposed at an angle to reflect the light passing through the entrance surface and out the exit surface.

[c12] 12. A lighting system for night vision applications comprising:
a near infrared light source;
a visible, non-red light source; and
an optical element arranged proximate said near infrared light source and said visible, non-red light source, the optical element receiving light from said near infrared source and said visible, non-red light source and emit-

ting said combined received light in a desired emission pattern such that said near infrared light is masked by said visible, non-red light.

[c13] 13. A lighting system according to claim 12 wherein said near infrared light source comprises a laser diode emitting light at wavelengths between approximately 800–900nm and said visible, non-red light source comprises a light source emitting light at wavelengths between approximately 400–600nm.

[c14] 14. A lighting system according to claim 12 wherein said visible, non-red light source comprises a plate having a plurality of non-red LEDs arranged thereon, said plate being arranged substantially parallel to an exterior surface of said optical element.

[c15] 15. A lighting system according to claim 14 wherein said optical element comprises a substantially planar thin-sheet optical element.

[c16] 16. A lighting system according to claim 15 wherein said plate is arranged proximate a surface of said optical element that is perpendicular to an input surface for receiving said near infrared light.

[c17] 17. A lighting system according to claim 14 wherein each non-red LED includes a respective collimating lens.

[c18] 18. A lighting system according to claim 12 comprising a camera adapted to receive near infrared light from said near infrared light source reflected off an object within a camera field of view.

[c19] 19. A lighting system according to claim 18 comprising a display for imaging objects detected within said camera field of view.

[c20] 20. A lighting system for night vision applications comprising:
a near infrared light source;
a thin-sheet optical element disposed a distance from said near infrared source, the optical element having an input surface for receiving light from said near infrared source and an output surface for emitting said received light in a desired emission pattern;
a visible, non-red light source comprising a plate having a plurality of non-red LEDs arranged thereon, said plate being proximate a surface of the optical element such that the output surface of said optical element emits said visible light to mask the emitted near infrared light;
a camera adapted to receive near infrared light from said near infrared light source reflected off an object within a camera field of view; and
a display for imaging objects detected within said cam-

era field of view.